

حمل الآن

مجاناً وحصرياً

# المراجعة رقم (1)

## اختبار شهر فبراير



# March Tests

## Model 1

**Total mark**

10

**Question 1** 5 marks

**A** Choose the correct answer :

1. If the distance between the centre of the third compression and the centre of the fifth compression on the wave propagation is 20 cm, then the wavelength of this wave is .....
  - a. 40 cm.
  - b. 20 cm.
  - c. 10 cm.
  - d. 5 cm.
2. The result of multiplying the frequency of an oscillating body by its periodic time equals .....
  - a.  $\frac{1}{2}$
  - b.  $\frac{1}{4}$
  - c.  $\frac{1}{3}$
  - d. 1
3. The scientific term that expresses the strength and the weakness of sound is .....
  - a. the frequency of sound.
  - b. the pitch of sound.
  - c. the quality of sound.
  - d. the intensity of sound.
4. The complete oscillation includes ..... displacement(s).
  - a. one
  - b. two successive
  - c. three successive
  - d. four successive

**B** Give a reason for :

Sound waves are longitudinal mechanical waves.


**Question 2** 5 marks

**A Complete the following sentences :**

1. Sharp tones have ..... frequencies, while rough tones have ..... frequencies.
2. The crest in the ..... wave is equivalent to the ..... in the longitudinal wave.
3. There are two types of periodic motion which are ..... motion and ..... motion.

**B What is meant by ... ?**

Sonic waves.

.....

.....

**Model 2**

Total mark

10

**Question 1** 5 marks

**A Write the scientific term :**

1. The distance between two successive crests or troughs. (.....)
2. The number of complete oscillations produced by the oscillating body in one second. (.....)
3. A property of sound by which the ears can distinguish between sharp and rough sounds. (.....)
4. The periodic motion made by a body around its point of rest, where the motion is repeated through equal intervals of time. (.....)

**B Savart's wheel rotates with a rate of 300 cycles per minute. A sound of frequency 600 Hz is produced when an elastic plate touches the teeth of one gear. Calculate the number of teeth of the gear.**

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# Part 1

## Question 2 5 marks

### A Compare between :

Transverse waves and longitudinal waves (one point only).

Transverse waves	Longitudinal waves
.....	.....
.....	.....
.....	.....
.....	.....

### B What does each of the following relationship indicate ?

- Wave frequency  $\times$  Wavelength. (.....)
- $\frac{\text{Number of rotations}}{\text{Time in seconds}} \times \text{Number of gear teeth in Savart's wheel.}$  (.....)
- $\frac{1}{\text{Frequency}}$  (.....)
- $\frac{\text{Wave velocity}}{\text{Frequency}}$  (.....)



## Test

**1**

Total mark

10

Answer the following questions :

### A Choose the correct answer :

(8 marks)

- 1 The periodic time of an oscillating body which makes 240 oscillations in one minute equals .....  
 (a) 1 sec. (b)  $\frac{1}{4}$  sec.  
 (c)  $\frac{1}{2}$  sec. (d) 4 sec.
- 2 The number of complete oscillations produced by an oscillating body in one second is known as .....  
 (a) periodic time. (b) amplitude.  
 (c) frequency. (d) time of amplitude.
- 3 All of the following are transverse waves, except ..... waves.  
 (a) water (b) light (c) sound (d) radio
- 4 Rarefaction is the area at which the medium particles .....  
 (a) don't vibrate. (b) are too close to each other.  
 (c) are faraway from each other. (d) vibrate up and down.

### B What happens when ...?

(2 marks)

You throw a stone in water.

.....

.....

## Test

## 2

Total mark

10

Answer the following questions :

**A Choose the correct answer :**

(8 marks)

1 Kinetic energy =  $\frac{1}{2} \times \dots\dots\dots$

(a)  $\frac{m}{v^2}$

(b)  $mv^2$

(c)  $m^2v^2$

(d)  $mv^3$

2 All of the following are examples of oscillatory motion, except .....

(a) motion of a string.

(b) motion of a tuning fork.

(c) motion of a car.

(d) motion of a simple pendulum.

3 All of the following are the properties of mechanical waves, except .....

(a) they are longitudinal or transverse waves.

(b) they don't propagate through vacuum.

(c) they don't need a medium to propagate through.

(d) water and sound waves are examples of these waves.

4 ..... are mechanical waves.

(a) Radio waves only

(b) Light waves only

(c) Microwaves and sound waves

(d) Water waves and sound waves

**B Give a reason for the following :**

(2 marks)

Wave motion is considered as a periodic motion.

.....

.....

**Test****3**

Total mark

10

Answer the following questions :

**A Choose the correct answer :**

(8 marks)

- 1 The periodic time of an oscillating body which makes ..... oscillations in one minute equals 0.25 second.
- (a) 60 (b) 240  
(c) 30 (d) 120
- 2 If the frequency of an oscillating body is 5 Hz, so the product of multiplying its frequency by its periodic time equals .....
- (a) 1 (b) 5  
(c) 10 (d) 25
- 3 The highest point of the particles of the medium in the transverse wave is known as the .....
- (a) crest. (b) compression.  
(c) rarefaction. (d) trough.
- 4 1 millimetre equals all the following values, except .....
- (a)  $1 \times 10^6$  nanometre. (b)  $1 \times 10^3$  micrometre.  
(c)  $1 \times 10^{-3}$  metre. (d)  $1 \times 10^{-3}$  micrometre.

**B What happens when ...?**

(2 marks)

The distance between two successive crests of a transverse wave is doubled.

.....

.....



## Test

4

Total mark

10

Answer the following questions :

**A Choose the correct answer :**

(8 marks)

- 1 The number of complete oscillations produced by an oscillating body in one second is known as .....
  - (a) periodic time.
  - (b) amplitude.
  - (c) frequency.
  - (d) time of amplitude.
- 2 The frequency of the oscillating body is measured by a unit called .....
  - (a) Hertz.
  - (b) watt/m.
  - (c) decibel.
  - (d) m/sec.
- 3 The periodic time of a tuning fork which makes 120 waves in ..... equals  $\frac{1}{4}$  sec.
  - (a) one second
  - (b) half second
  - (c) one minute
  - (d) half minute
- 4 The mathematical relation between the velocity and wavelength is .....
  - (a) velocity = frequency  $\times$  wavelength.
  - (b) velocity = wavelength / frequency.
  - (c) wavelength = frequency / velocity.
  - (d) velocity = frequency / wavelength.

**B Give a reason for the following :**

(2 marks)

Frequency  $\times$  periodic time = 1

.....

.....

## Test

## 5

Total mark

10

Answer the following questions :

**A Choose the correct answer :**

(8 marks)

- 1 A simple pendulum makes 540 complete oscillations in a minute, so its frequency is ..... Hz.
- (a) 3 (b) 6  
(c) 9 (d) 12
- 2 1 Gigahertz = ..... Kiloherzt.
- (a)  $10^2$  (b)  $10^3$   
(c)  $10^6$  (d)  $10^9$
- 3 Transverse wave consists of .....
- (a) compressions and rarefactions. (b) troughs and rarefactions.  
(c) compressions and crests. (d) crests and troughs.
- 4 The distance between two successive crests or two successive troughs in the transverse wave is .....
- (a) wavelength. (b) wave velocity.  
(c) amplitude. (d) frequency.

**B What happens when ...?**

(2 marks)

The number of complete oscillations equals to the time taken by the vibrating body to make these oscillations.

.....  
.....



## Answers of Test

**1**

A 1 (b)

2 (c)

3 (c)

4 (c)

B Concentric circles propagate on the water surface.

## Answers of Test

**2**

A 1 (b)

2 (c)

3 (c)

4 (d)

B Because it is repeated regularly in equal periods of time.

## Answers of Test

**3**

A 1 (b)

2 (a)

3 (a)

4 (d)

B The wavelength of the transverse wave is doubled.

## Answers of Test

**4**

A 1 (c)

2 (a)

3 (d)

4 (a)

B Because the frequency is the reciprocal of the periodic time , ( $F = \frac{1}{T}$ ).

## Answers of Test

**5**

A 1 (c)

2 (c)

3 (d)

4 (a)

B The value of frequency equals to that of periodic time.

# كيفية طباعة صفحات معينة من ملف معين مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9



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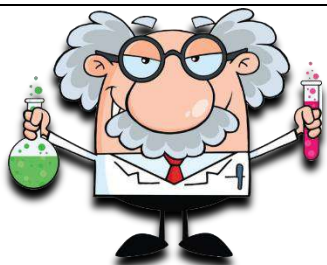
مجاناً وحصرياً

# المراجعة رقم (2)

## اختبار شهر فبراير







# Second Term

## February Exam Revision



### -Complete The following sentences:

- 1-Waves are classified according to the ability to propagate and transfer energy to ..... and .....
- 2-The simple harmonic motion is an example of the .....
- 3-..... waves need a medium to propagate.
- 4-The complete oscillation includes ..... successive maximum displacements, each one is called .....
- 5-The crest in the ..... wave is equivalent to the ..... in the longitudinal wave.
- 6-The transverse wave consists of ..... and .....
- 7-The frequency of 540 oscillations in one minute is ..... and periodic time is .....
- 8-..... motion and ..... motion are two types of periodic motions.
- 9-The ..... motion is considered by simplest form of oscillatory motion.
- 10-If an oscillating body makes 20 complete oscillations in 10 seconds, its frequency equals .....Hz.
- 11-Frequency x periodic time = .....
- 12-The crest in transverse wave equivalent to ..... in longitudinal wave.
- 13-Kinetic energy is ..... proportional to body velocity.
- 14-.....is the measuring unit of frequency.
- 15-The velocity of oscillating body reaches its maximum value when it passes through its .....
- 16-Radio waves are considered as ..... waves.
- 17-A simple pendulum makes 300 complete oscillations in a minute, so its periodic time is ..... sec.
- 18-Waves are classified according to the direction of vibration of medium particles relative to the direction of wave propagation into ..... and .....
- 19-..... is the area of longitudinal wave at which the medium particles are of the highest density and pressure.
- 20-..... is the time taken by an oscillating body to make one complete oscillation, while ..... is the number of complete oscillations made by an oscillating body in one second.

21-Wavelength of transverse wave is the distance between two successive

..... or .....

22-Radio waves are considered as ..... waves that propagate through free space with a velocity of .....

23-The frequency of an oscillating body is the ..... of the periodic time.

### **-Choose The correct answer:**

1-The highest point of the particles of the medium in the transverse wave is known as .....

a-crest                      b-compression                      c-rarefaction                      d-trough

2-The maximum displacement achieved by oscillating body away from its rest position is called .....

a-frequency                      b-amplitude                      c-periodic time                      d-complete oscillation

3-All of the following waves propagate through vacuum, except .....

a-light                      b-radio                      c-sound                      d-infrared

4-The result of multiplying frequency of body by its periodic times equals.....

a-1                      b-0.5                      c-0.1                      d-4

5-The time taken by an oscillating body to make one complete oscillation is known as .....

a-periodic time                      b-amplitude                      c-frequency                      d-complete oscillation

6-If the frequency of oscillating body is 5 Hz, then its periodic time equals

.....

a-50 sec                      b-5 sec                      c-0.5 sec                      d-1/5 sec

7-The number of waves produced in one second is called .....

a-frequency                      b-amplitude                      c-velocity                      d-periodic time

8-If the frequency of an oscillating body is 8 Hz, the periodic time is .....

a-8 sec                      b-1/8 sec                      c-1 sec                      d-2 m

9-The time of amplitude is equivalent to ..... periodic time.

a-quarter                      b-half                      c-double                      d-three times.

10-The periodic time of a source that makes 60 oscillations/minute = .....

a-6 sec                      b-1 sec                      c-0.1 sec                      d-10 sec

11-The wavelength of a sound wave propagating through sea water with velocity 1500 m/sec, knowing that its frequency is 10 kilohertz, is ..... m

a-150                      b-1/150                      c-0.15                      d-0.015

12-The result of multiplying the frequency of an oscillating body by its periodic time equals.....

a-variable value                      b-negative value                      c-constant value                      d-one



13-The periodic time of a tuning fork which makes 240 waves in one minute is .....

- a-1 sec      b-4 sec      c-0.5 sec      d-1/4 sec

14-The periodic time for an oscillating body that makes 500 complete oscillations in 50 seconds is .....

- a-0.1 sec      b-10 sec      c-5 sec      d-0.5 sec

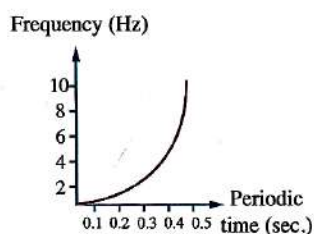
15-The frequency of oscillation body is 6 Hz, the periodic time is ..... sec

- a-6      b-3      c-1/6      d-1/3

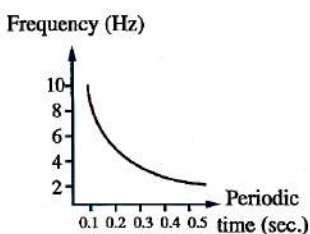
16-

Which figure represents the relation between the periodic time and the frequency ? .....

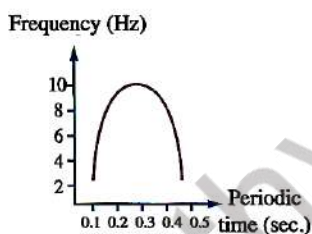
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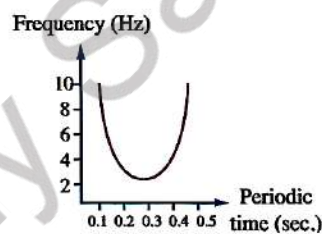
a.



b.



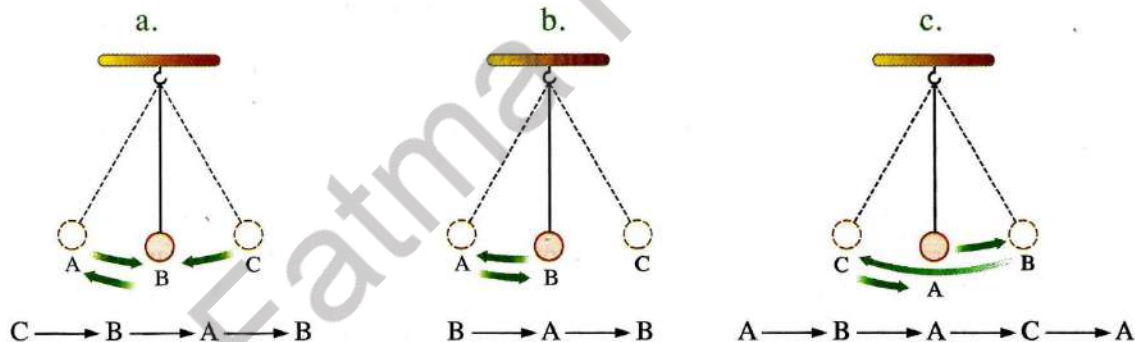
c.



d.

17-

Which figure represents a half complete oscillation ? .....



**-Write the scientific terms of each of the following:**

1-The maximum displacement done by the oscillating body away from its original position.

2-The motion which is regularly repeated in equal periods of time.

3-The distance covered by wave in one second.

4-The measuring unit of frequency.

5-Number of complete oscillations made by an oscillating body in one second.

6-The highest point of the particles of the medium in the transverse wave.

7-The area in longitudinal wave at which the medium particles are the highest density and pressure.

8-The result of multiplying frequency and periodic time.

9-Wave, in which the particles of medium vibrate perpendicular to direction of wave propagation.

10-The periodic motion made by the oscillating body around its rest position, where the motion is repeated through equal intervals of time.

11-The distance between two successive crests or troughs.

12-The distance between the centers of two successive compressions or two successive rarefactions.

**-Cross out the odd word, then write the name of the others:**

1-Pendulum motion - Spring motion - Rotary bee motion - Stretched string motion

2-Tuning fork - Simple pendulum - Spring - Water.

3-Water waves - Radio waves - Light waves - Infrared waves.

4-Frequency - Wavelength - Displacement - Wave velocity

5-Movement of pendulum - Movement of Earth around Sun - Fan movement - Rotary bee movement.

6-Nanometer - Hertz - Gigahertz - Megahertz

7-Pendulum movement - Spring movement - Car movement - Stretched string movement

**-Put true or false and correct the wrong sentences:**

1-Sound velocity through liquids is more than that through gases. ( )

2-The wavelength for a longitudinal wave is the distance between the center of first crest and the center of second crest. ( )

3-Amplitude of a wave is the time taken for one wave. ( )

4-The motion of stretched string is a wave motion. ( )

5-Crest is the highest point of the particles of the medium in the transverse wave. ( )

6-The simple harmonic motion is considered the simplest form of oscillatory motion. ( )

7-The sound velocity through solids is less than that through liquids. ( )

8-The velocity of the oscillating body is maximum when passing at rest position. ( )

9-Periodic motion is the type of motion regularly repeated in equal periods of time. ( )

10-The speed of pendulum reaches maximum at rest position. ( )

11-Sound waves consist of compressions and rarefactions. ( )

12-A vibrating body makes  $\frac{1}{4}$  complete vibration in  $\frac{1}{64}$  sec, its frequency is 6 Hz. ( )

13-Sound velocity through gases is more than that through liquids. ( )

14-Wavelength is directly proportional with frequency. ( )

15-The frequency of the oscillating body is the reciprocal of the periodic time. ( )

16-The result of multiplying the frequency of an oscillating body by its periodic time equals  $\frac{1}{2}$ . ( )

17-Crest is the highest point of the particles of the medium in transverse wave. ( )

18-The product of multiplying frequency and periodic time equals one. ( )

19-Wave amplitude is the number of waves produced from the source in one second. ( ).....

20-Wave velocity = frequency x wavelength. ( )

21-In the transverse wave, the particles of the medium vibrate in the same direction of the wave propagation. ( )

### **-Correct the underlined words:**

1-The trough of the transverse wave is equivalent to the center of compression of the longitudinal.

2-Light wave and sound wave are electromagnetic waves.

3-Rotary bee and tuning fork produce oscillatory motion.

4- The distance between first crest and third crest of a wave is 20 cm, so the wave length of this wave is 20 cm.

5-The transitional motion is the motion repeated through equal intervals of time.

6-The highest point in transverse wave is called compression.

7-The motion of tuning fork is a wave motion.

8-Electromagnetic waves are waves that need a medium to propagate through.

9-The measuring unit of wavelength is a kilogram.

10-The velocity of sound waves through air = 1850 m/s.

11-The maximum displacement achieved by the oscillating body away from its rest position is frequency.

12-The distance covered by the wave in one second is called wavelength.

13-The light is a mechanical transverse wave.



14-If the vertical distance between the crest and the trough is 40 cm, so the wave amplitude is 15 cm.

15-The distance between the second crest and sixth crest is 20 cm, when the wavelength of the wave is 10 cm.

16-Ultraviolet waves and infrared waves have same frequency in vacuum.

17-The oscillatory motion is considered as a translational motion.

18-The measuring unit of frequency is meter.

19-Simple harmonic motion is the simplest form of the translational motion.

20-The wavelength of the transverse wave is the distance between the centers of two successive compressions.

### -Give a reason for:

1-The oscillatory is considered as a periodic motion.

2-Seeing lightening before hearing thunder.

3-Rotary bee is a periodic motion cannot be considered as oscillatory motion.

4-The motion of planets around the sun is considered as a periodic motion.

5-The motion of spring is considered as oscillatory motion.



**6-The kinetic energy of pendulum is maximum when the pendulum is passes its rest position.**

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**7-The periodic time of an oscillating body decreases as the number of complete oscillations increases at the same time.**

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**8-In Newton Cradles when a ball strikes the second ball, the last ball moves while the first one stops.**

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**9- The flame of a candle vibrates forward and backward if we put the candle in front of a loud speaker.**

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**10-Sound wave are mechanical longitudinal waves.**

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**11-Water waves are transverse mechanical waves.**

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**12-Jacuzzi is considered as a natural bath.**

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**13-We cannot hear the sound of solar explosions, but we can see the light coming out of them.**

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14-As the frequency of the wave in the same medium increases, its wavelength decreases.

15- The velocity of light waves equals the velocity of radio waves, although the difference in their frequencies.

### **-What happens if:**

1-The particles of the medium vibrate a long direction as the wave propagation.

2-The oscillating body passes its rest position during its movement.

3-Increasing velocity of pendulum.

4-Number of oscillations produced by a vibrating body increases.

5-The number of complete oscillations equals to the time taken by the vibrating body to make these oscillations.

6-The vibration of the particles of a medium in a direction normal the direction of wave propagation.

7-Propagation of a wave in a medium as pulses of compressions and rarefactions.

8-The distance between two successive crests of a transverse wave is doubled.

### **-Problems:**

1- Sound waves have frequency 400 Hz in air and its wavelength is 85 cm, calculate velocity of these waves.

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2- Calculate the frequency of a simple pendulum which makes 720 complete oscillations in 90 second.

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3- Calculate the frequency of a body makes 240 complete oscillations in one minute.

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4- Calculate the periodic time for an oscillating body that makes 300 complete oscillations in half a minute.

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5- Calculate periodic time and frequency for oscillating body that makes 300 complete oscillations in half a minute.

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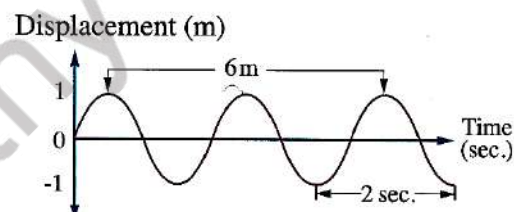
6- Calculate wave velocity of transverse wave, whose the distance between second crest and tenth crest is 40 m and frequency is double its wavelength.

7- Calculate the wavelength of a sound wave propagation through water with velocity 1500 m/sec knowing that the frequency is 10 kilohertz.

### -Variant Questions:

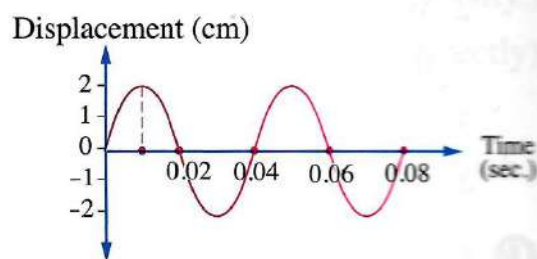
**C** From the opposite figure calculate :

- Wavelength.
- Frequency.
- Amplitude.



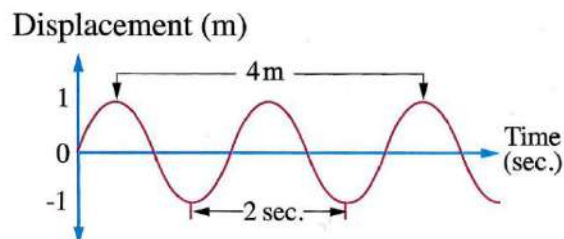
The opposite figure shows the relation between the displacement and the time in a transverse wave that takes place in water with velocity 20 m/sec.

- Amplitude.
- Frequency.
- Wavelength.



Look at the opposite figure then calculate :

- Frequency.
- Wavelength.

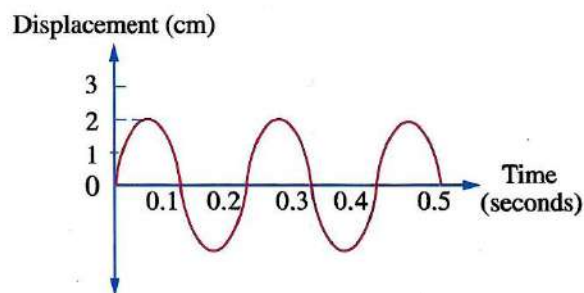




**From the opposite figure of the oscillatory motion of a simple pendulum, calculate :**

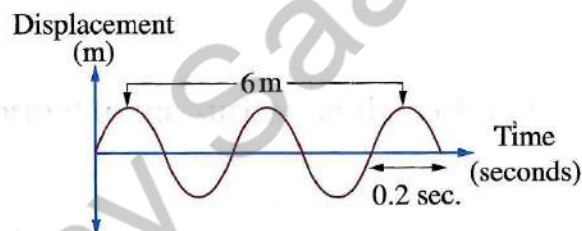
1. Amplitude.
2. Periodic time.
3. Frequency.

.....  
 .....  
 .....



**From the opposite figure, find :**

1. Wavelength.
2. The time of one wave (periodic time).
3. Frequency.
4. Wave velocity.

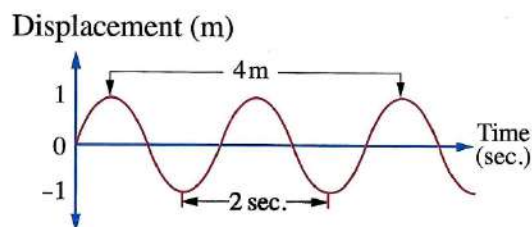


**Complete the following :**

1. From the opposite figure :

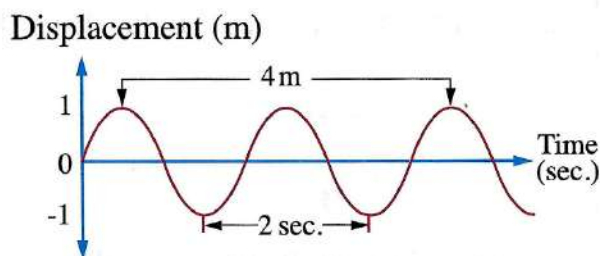
- a. Wavelength = ..... m.
- b. Periodic time = ..... sec.
- c. Wave speed = ..... m/s.

2. Multiplying periodic time and frequency equals .....



**From the opposite figure, find :**

1. Amplitude.
2. Periodic time.
3. Frequency.
4. Wavelength.





From the opposite figure, choose the correct answer :

1. The periodic time = .....

- a. 2 sec.                      b. 8 sec.  
c. 6 sec.                      d. 3 sec.

2. The frequency = .....

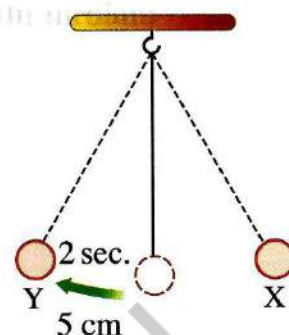
- a. 0.2 sec.                      b. 0.4 Hz.  
c.  $\frac{1}{8}$  cycle/sec.                      d. 0.4 m.

3. Amplitude = .....

- a. 0.2 sec.                      b. 0.4 Hz.                      c. 3 cm.                      d. 5 cm.

4. The distance covered in a complete oscillation = .....

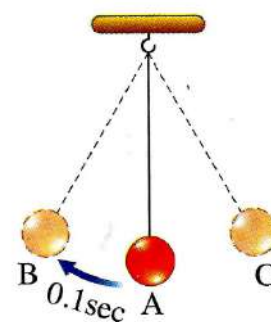
- a. 0.2 sec.                      b. 0.4 Hz.                      c. 20 cm.                      d. 5 cm.



In the opposite figure, when the ball of pendulum moves from (B) to (C) a displacement of (2cm) from the figure,

Find :

1. The amplitude.
2. Periodic time.
3. The frequency.



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Study the following figures, then answer the following questions :

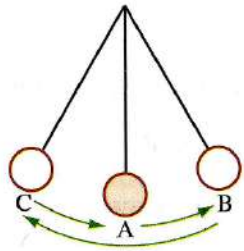


Fig. (1)

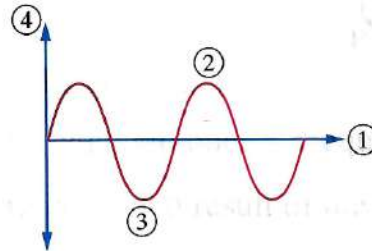


Fig. (2)

1. What are these figures represent ?

2. Label the figure (2).

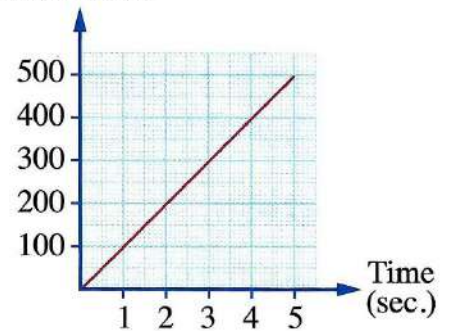
① ..... ② ..... ③ ..... ④ .....

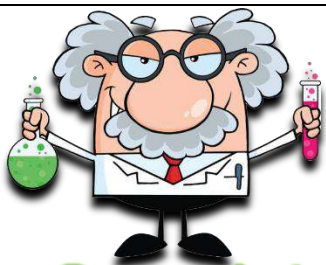
3. What is the number of displacements in fig. (1) ?

The opposite graph shows the relation between the number of complete oscillations (N) made by an oscillating body and the time (T) in seconds. From the graph find :

1. The number of complete oscillations made by the oscillating body after 4 seconds.
2. The time in which the oscillating body makes 200 oscillations.
3. The frequency of the oscillating body.
4. The periodic time.

No. of complete oscillations





# Second Term

## February Exam Revision



### -Complete The following sentences:

- 1-Waves are classified according to the ability to propagate and transfer energy to **mechanical** and **electromagnetic**
- 2-The simple harmonic motion is an example of the **oscillatory motion**.
- 3- **Mechanical** waves need a medium to propagate.
- 4-The complete oscillation includes **four** successive maximum displacements, each one is called **amplitude**
- 5-The crest in the **transverse** wave is equivalent to the **compression** in the longitudinal wave.
- 6-The transverse wave consists of **crests** and **troughs**
- 7-The frequency of 540 oscillations in one minute is **9 Hz** and periodic time is **1/9 seconds**
- 8-**Oscillatory** motion and **wave** motion are two types of periodic motions.
- 9-The **simple harmonic motion** is considered by simplest form of oscillatory motion.
- 10-If an oscillating body makes 20 complete oscillations in 10 seconds, its frequency equals **2 Hz**.
- 11-Frequency x periodic time = **1**
- 12-The crest in transverse wave equivalent to **compression** in longitudinal wave.
- 13-Kinetic energy is **directly** proportional to body velocity.
- 14-**Hertz** is the measuring unit of frequency.
- 15-The velocity of oscillating body reaches its maximum value when it passes through its **rest point**
- 16-Radio waves are considered as **electromagnetic** waves.
- 17-A simple pendulum makes 300 complete oscillations in a minute, so its periodic time is **0.2** sec.
- 18-Waves are classified according to the direction of vibration of medium particles relative to the direction of wave propagation into **transverse** and **longitudinal**
- 19-**Compression** is the area of longitudinal wave at which the medium particles are of the highest density and pressure.



20- **Periodic time** is the time taken by an oscillating body to make one complete oscillation, while **frequency** is the number of complete oscillations made by an oscillating body in one second.

21-Wavelength of transverse wave is the distance between two successive **crests** or **troughs**

22-Radio waves are considered as **electromagnetic** waves that propagate through free space with a velocity of  **$3 \times 10^8$  m/s**

23-The frequency of an oscillating body is the **reciprocal** of the periodic time.

### **-Choose The correct answer:**

1-The highest point of the particles of the medium in the transverse wave is known as .....

**a-crest**                      b-compression                      c-rarefaction                      d-trough

2-The maximum displacement achieved by oscillating body away from its rest position is called .....

a-frequency                      **b-amplitude**                      c-periodic time                      d-complete oscillation

3-All of the following waves propagate through vacuum, except .....

a-light                      b-radio                      **c-sound**                      d-infrared

4-The result of multiplying frequency of body by its periodic times equals.....

**a-1**                      b-0.5                      c-0.1                      d-4

5-The time taken by an oscillating body to make one complete oscillation is known as .....

**a-periodic time**                      b-amplitude                      c-frequency                      d-complete oscillation

6-If the frequency of oscillating body is 5 Hz, then its periodic time equals .....

a-50 sec                      b-5 sec                      c-0.5 sec                      **d-1/5 sec**

7-The number of waves produced in one second is called .....

**a-frequency**                      b-amplitude                      c-velocity                      d-periodic time

8-If the frequency of an oscillating body is 8 Hz, the periodic time is .....

a-8 sec                      **b-1/8 sec**                      c-1 sec                      d-2 m

9-The time of amplitude is equivalent to ..... periodic time.

**a-quarter**                      b-half                      c-double                      d-three times.

10-The periodic time of a source that makes 60 oscillations/minute = .....

a-6 sec                      **b-1 sec**                      c-0.1 sec                      d-10 sec

11-The wavelength of a sound wave propagating through sea water with velocity 1500 m/sec, knowing that its frequency is 10 kilohertz, is ..... m

a-150                      b-1/150                      **c-0.15**                      d-0.015



12-The result of multiplying the frequency of an oscillating body by its periodic time equals.....

a-variable value      b-negative value      c-constant value      d-one

13-The periodic time of a tuning fork which makes 240 waves in one minute is .....

a-1 sec      b-4 sec      c-0.5 sec      d-1/4 sec

14-The periodic time for an oscillating body that makes 500 complete oscillations in 50 seconds is .....

a-0.1 sec      b-10 sec      c-5 sec      d-0.5 sec

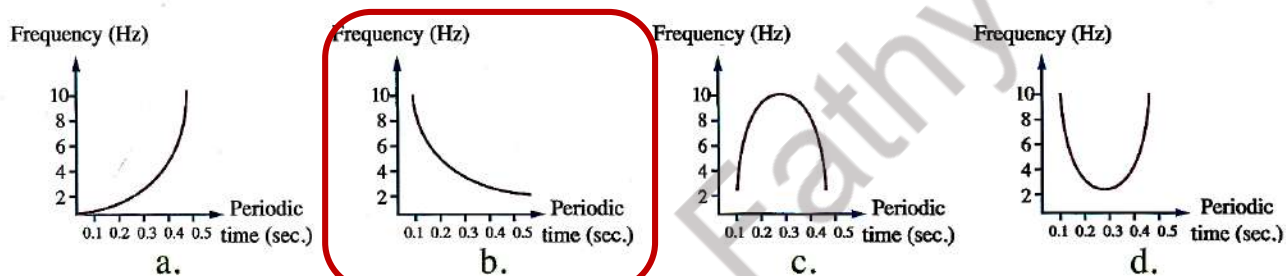
15-The frequency of oscillation body is 6 Hz, the periodic time is ..... sec

a-6      b-3      c-1/6      d-1/3

16-

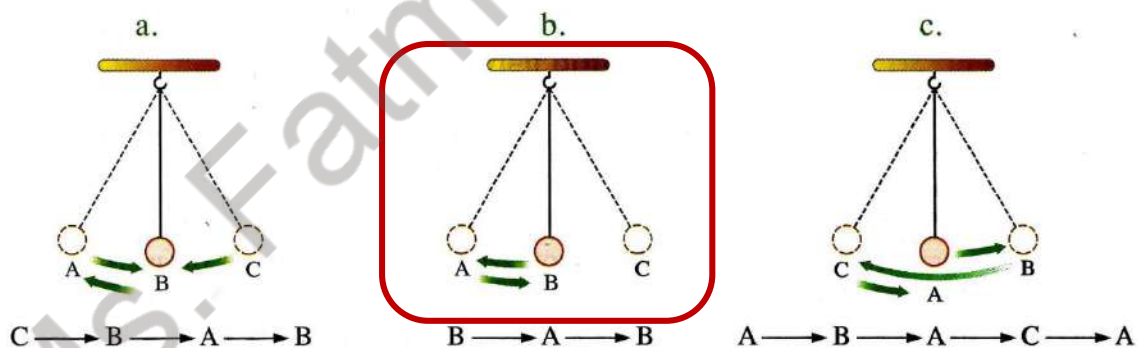
Which figure represents the relation between the periodic time and the frequency ? .....

(El-Behaira 2023)



17-

Which figure represents a half complete oscillation ? .....



**-Write the scientific terms of each of the following:**

1-The maximum displacement done by the oscillating body away from its original position. **Amplitude**

2-The motion which is regularly repeated in equal periods of time.

**Periodic motion**

3-The distance covered by wave in one second. **Wave Velocity**

4-The measuring unit of frequency. **Hertz**

5-Number of complete oscillations made by an oscillating body in one second.  
**Frequency**

6-The highest point of the particles of the medium in the transverse wave.

**Crest**

7-The area in longitudinal wave at which the medium particles are the highest density and pressure. **Compression**

8-The result of multiplying frequency and periodic time. **one**

9-Wave, in which the particles of medium vibrate perpendicular to direction of wave propagation. **Transverse wave**

10-The periodic motion made by the oscillating body around its rest position, where the motion is repeated through equal intervals of time.

**Oscillatory motion**

11-The distance between two successive crests or troughs. **Wavelength**

12-The distance between the centers of two successive compressions or two successive rarefactions. **Wavelength**

**-Cross out the odd word, then write the name of the others:**

1-Pendulum motion - Spring motion - **Rotary bee motion** - Stretched string motion. (**Oscillatory motion**)

2-Tuning fork - Simple pendulum - Spring - **Water**. (**Oscillatory motion**)

3-**Water waves** - Radio waves - Light waves - Infrared waves.

(**Electromagnetic waves**)

4-Frequency - Wavelength - **Displacement** - Wave velocity

(**Law of wave propagation**)

5-**Movement of pendulum** - Movement of Earth around Sun - Fan movement - Rotary bee movement. (**Periodic motion**)

6-**Nanometer** - Hertz - Gigahertz - Megahertz (**units of frequency**)

7-Pendulum movement - Spring movement - **Car movement** - Stretched string movement. (**Oscillatory motion**)

**-Put true or false and correct the wrong sentences:**

1-Sound velocity through liquids is more than that through gases. (**√**)

2-The wavelength for a longitudinal wave is the distance between the center of first **crest** and the center of second **crest**. (**X**) (**Compression**)

3-**Amplitude** of a wave is the time taken for one wave. (**X**) (**Periodic time**)

- 4-The motion of stretched string is a **wave** motion. ( X ) (oscillatory)
- 5-Crest is the highest point of the particles of the medium in the transverse wave. ( ✓ )
- 6-The simple harmonic motion is considered the simplest form of oscillatory motion. ( ✓ ).
- 7-The sound velocity through solids is **less** than that through liquids. ( X ) (more)
- 8-The velocity of the oscillating body is maximum when passing at rest position. ( ✓ )
- 9-Periodic motion is the type of motion regularly repeated in equal periods of time. ( ✓ )
- 10-The speed of pendulum reaches maximum at rest position. ( ✓ )
- 11-Sound waves consist of compressions and rarefactions. ( ✓ )
- 12-A vibrating body makes  $\frac{1}{4}$  complete vibration in  $\frac{1}{64}$  sec, its frequency is **6** Hz. ( X ) (16 Hz)
- 13-Sound velocity through gases is **more** than that through liquids. ( X ) (less)
- 14-Wavelength is **directly** proportional with frequency. ( X ) (inversely)
- 15-The frequency of the oscillating body is the reciprocal of the periodic time. ( ✓ )
- 16-The result of multiplying the frequency of an oscillating body by its periodic time equals  $\frac{1}{2}$ . ( X ) (one)
- 17-Crest is the highest point of the particles of the medium in transverse wave. ( ✓ )
- 18-The product of multiplying frequency and periodic time equals one. ( ✓ )
- 19-**Wave amplitude** is the number of waves produced from the source in one second. ( X ) (Wave Frequency)
- 20-Wave velocity = frequency x wavelength. ( ✓ )
- 21-In the **transverse** wave, the particles of the medium vibrate in the same direction of the wave propagation. ( X ) (Longitudinal)

### -Correct the underlined words:

- 1-The trough of the transverse wave is equivalent to the center of compression of the longitudinal. **rarefaction**



2-Light wave and sound wave are electromagnetic waves. **Radio**

3-Rotary bee and tuning fork produce oscillatory motion. **stretched string**

4- The distance between first crest and third crest of a wave is 20 cm, so the wave length of this wave is 20 cm. **10 cm**

5-The transitional motion is the motion repeated through equal intervals of time.  
**Periodic Motion**

6-The highest point in transverse wave is called compression. **Crest**

7-The motion of tuning fork is a wave motion. **Oscillatory motion**

8-Electromagnetic waves are waves that need a medium to propagate through.  
**Mechanical Waves**

9-The measuring unit of wavelength is a kilogram. **Meter**

10-The velocity of sound waves through air = 1850 m/s. **340 m/s**

11-The maximum displacement achieved by the oscillating body away from its rest position is frequency. **Amplitude**

12-The distance covered by the wave in one second is called wavelength.  
**Wave Velocity**

13-The light is a mechanical transverse wave. **Sound**

14-If the vertical distance between the crest and the trough is 40 cm, so the wave amplitude is 15 cm. **20 cm**

15-The distance between the second crest and sixth crest is 20 cm, when the wavelength of the wave is 10 cm. **40 cm**

16-Ultraviolet waves and infrared waves have same frequency in vacuum.  
**velocity**



17-The oscillatory motion is considered as a translational motion.  
**periodic motion**

.....

18-The measuring unit of frequency is meter. **Hertz**

.....

19-Simple harmonic motion is the simplest form of the translational motion.  
**Oscillatory Motion**

.....

20-The wavelength of the transverse wave is the distance between the centers of two successive compressions. **Longitudinal**

.....

### **-Give a reason for:**

1-The oscillatory is considered as a periodic motion.

Because it is regularly repeated at equal intervals of time.

2-Seeing lightening before hearing thunder.

Because lightening is electromagnetic waves while thunder is a mechanical wave and velocity of light waves of lightening is much greater than velocity of sound waves of thunder.

3-Rotary bee is a periodic motion cannot be considered as oscillatory motion.

Because it is repeated regularly at equal intervals of time, while it is not an oscillatory motion because it is not repeated on the two sides of rest point.

4-The motion of planets around the sun is considered as a periodic motion.

Because it is repeated regularly at equal intervals of time.

5-The motion of spring is considered as oscillatory motion.

Because it is regularly repeated at equal intervals of time around the two sides of rest point.

6-The kinetic energy of pendulum is maximum when the pendulum is passes its rest position. Because the velocity of a pendulum is maximum when it passes its rest position where kinetic energy is directly proportional to the square of velocity

7-The periodic time of an oscillating body decreases as the number of complete oscillations increases at the same time.

Because periodic time is inversely proportional to the number of complete oscillations made by body.

8-In Newton Cradles when a ball strikes the second ball, the last ball moves while the first one stops.

Because the first ball transvers its energy to the second one through the rest of the fixed balls

9- The flame of a candle vibrates forward and backward if we put the candle in front of a loud speaker.

Because the sound waves produced from the loud speaker propagate carrying energy in the same direction of propagation causing vibration of candle flame.

10-Sound wave are mechanical longitudinal waves.

They are longitudinal waves because the medium particles vibrate along the direction of wave propagation forming compression and rarefactions and mechanical waves because they need a medium to propagate through.

11-Water waves are transverse mechanical waves.

They are transverse because the medium particles vibrate perpendicular to the direction of wave propagation forming crests and troughs and mechanical waves because they need a medium to propagate through.

12-Jacuzzi is considered as a natural bath.

Because it is used to treated sprains and cramps by using hot water and nervous tension to treat cold water.

13-We cannot hear the sound of solar explosions, but we can see the light coming out of them.

Because the sound is mechanical waves which can't propagate through vacuum between the Sun and the Earth while the light is electromagnetic waves which can propagate through vacuum.

14-As the frequency of the wave in the same medium increases, its wavelength decreases.

Because as velocity is constant in the same medium, so frequency is inversely proportional to wavelength.

15- The velocity of light waves equals the velocity of radio waves, although the difference in their frequencies.

Because both of them are electromagnetic waves have the same velocity in vacuum so the product of multiplying the frequency in the wavelength for each of them equals constant value.

### **-What happens if:**

1-The particles of the medium vibrate a long direction as the wave propagation.  
A longitudinal wave is formed.

2-The oscillating body passes its rest position during its movement.  
The velocity will be maximum.

3-Increasing velocity of pendulum.  
Kinetic energy will increase.

4-Number of oscillations produced by a vibrating body increases.

Frequency will increase

5-The number of complete oscillations equals to the time taken by the vibrating body to make these oscillations.

The value of frequency will be equal to periodic time.

6-The vibration of the particles of a medium in a direction normal the direction of wave propagation.

A transverse wave is formed.

7-Propagation of a wave in a medium as pulses of compressions and rarefactions.

Medium particles will vibrate along direction of wave propagation forming longitudinal wave.

8-The distance between two successive crests of a transverse wave is doubled.

The frequency will decrease to half.

9-Frequency and velocity of wave propagation decrease to quarter.

Wavelength does not change.

### **-Problems:**

1- Sound waves have frequency 400 Hz in air and its wavelength is 85 cm, calculate velocity of these waves.

$$F = 400 \text{ Hz} \quad \text{wavelength} = 85 \text{ cm} = 0.85 \text{ m}$$

$$V = F \times \text{wavelength} = 400 \times 0.85 = 340 \text{ m/s}$$

2-Calculate the frequency of a simple pendulum which makes 720 complete oscillations in 90 second.

$$\begin{aligned} \text{Frequency} &= \text{no of complete oscillation} / \text{time} \\ &= 720 / 90 = 8 \text{ Hz} \end{aligned}$$

3-Calculate the frequency of a body makes 240 complete oscillations in one minute.

$$\begin{aligned} \text{Frequency} &= \text{No. of complete oscillations} / \text{Time} \\ &= 240/60 = 4 \text{ Hz} \end{aligned}$$

4-Calculate the periodic time for an oscillating body that makes 300 complete oscillations in half a minute.

$$\begin{aligned} \text{Frequency} &= \text{No. of complete oscillations} / \text{Time} \\ &= 300/30 = 10 \text{ Hz} \end{aligned}$$



5- Calculate periodic time and frequency for oscillating body that makes 300 complete oscillations in half a minute.

$$\text{Frequency} = \text{No of complete oscillations} / \text{time} \\ = 300 / 30 = 10 \text{ Hz}$$

$$\text{Periodic time} = 1/\text{frequency} = 1/10 = 0.1 \text{ sec}$$

6- Calculate wave velocity of transverse wave, whose the distance between second crest and tenth crest is 40 m and frequency is double its wavelength.

$$\text{No of waves} = 10 - 2 = 8 \text{ waves}$$

$$\text{wavelength} = \text{distance covered by wave} / \text{No of waves} \\ = 40 / 8 = 5 \text{ m}$$

$$\text{Frequency} = 2 \times \text{wavelength} = 2 \times 5 = 10 \text{ Hz}$$

$$\text{Velocity} = \text{Frequency} \times \text{wavelength} = 10 \times 5 = 50 \text{ m/s}$$

7- Calculate the wavelength of a sound wave propagation through water with velocity 1500 m/sec knowing that the frequency is 10 kilohertz.

$$\text{Frequency} = 10 \times 1000 = 10000 \text{ Hz}$$

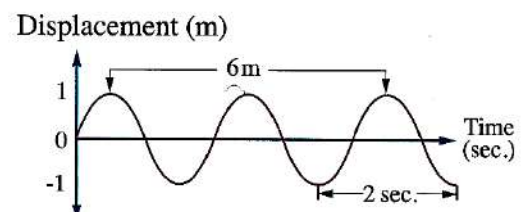
$$\text{Wavelength} = \text{Velocity} / \text{frequency} = 1500 / 10000 = 0.15 \text{ m}$$

### -Variant Questions:

© From the opposite figure calculate :

- Wavelength.
- Frequency.
- Amplitude.

**a- 3 m      b-0.5 Hz.      c- 1 m**

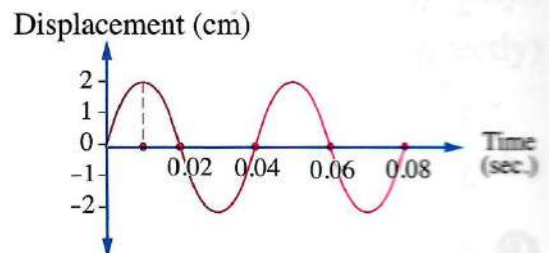


The opposite figure shows the relation between the displacement and the time in a transverse wave that takes place in water with velocity 20 m/sec.

- Amplitude.
- Frequency.
- Wavelength.

**1-2 cm      2-25 Hz**

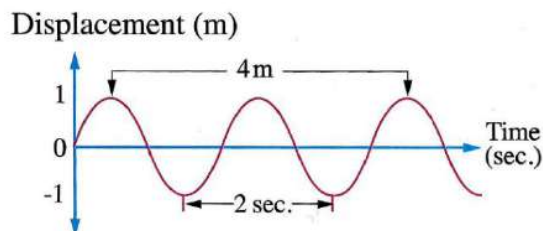
$$\text{3-wavelength} = \text{velocity} / \text{frequency} = 20 / 25 = 0.8 \text{ m}$$





Look at the opposite figure then calculate :

1. Frequency.
2. Wavelength.



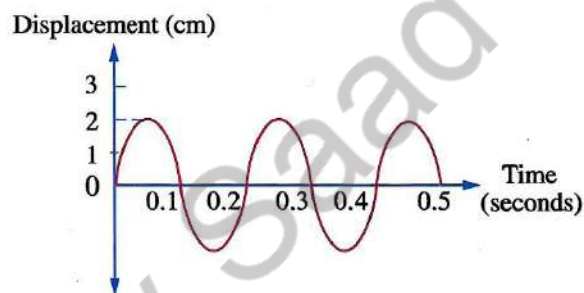
**1-0.5 Hz.**

**2- 2 m**

From the opposite figure of the oscillatory motion of a simple pendulum, calculate :

1. Amplitude.
2. Periodic time.
3. Frequency.

.....  
 .....  
 .....



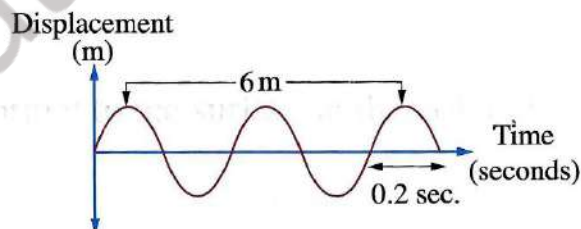
**1-2 cm**

**2-0.2 sec**

**3- 5 Hz**

From the opposite figure, find :

1. Wavelength.
2. The time of one wave (periodic time).
3. Frequency.
4. Wave velocity.



**1- 3 m**

**2- 0.4 sec**

**3- Frequency =  $1/0.4 = 2.5$  Hz**

**4-  $V = F \times \text{Wavelength}$**

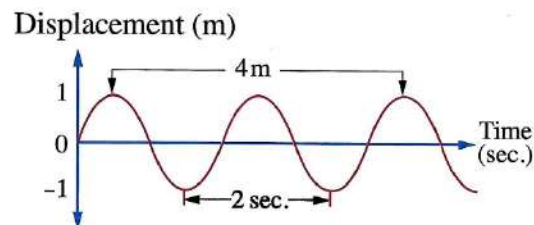
**so,  $V = 2.5 \times 3 = 7.5$  m/s**

Complete the following :

1. From the opposite figure :

- a. Wavelength = ..... m.
- b. Periodic time = ..... sec.
- c. Wave speed = ..... m/s.

2. Multiplying periodic time and frequency equals .....



**1- a. 2 m**

**b. 2 sec**

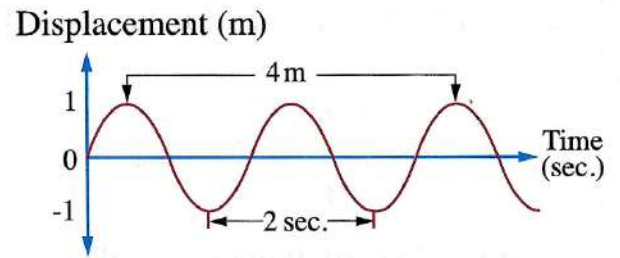
**c.  $F=1/2$**

**,so velocity =  $F \times \text{wavelength} = 0.5 \times 2 = 1$  m/s**

**2-one**

From the opposite figure, find :

1. Amplitude.
2. Periodic time.
3. Frequency.
4. Wavelength.



1- 1 m      2- 2 sec      3-0.5 Hz.      4- 2 m

From the opposite figure, choose the correct answer :

1. The periodic time = .....

- a. 2 sec.      **b. 8 sec.**  
 c. 6 sec.      d. 3 sec.

2. The frequency = .....

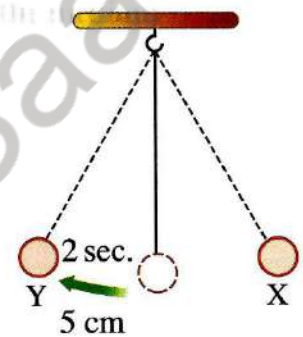
- a. 0.2 sec.      b. 0.4 Hz.  
**c.  $\frac{1}{8}$  cycle/sec.**      d. 0.4 m.

3. Amplitude = .....

- a. 0.2 sec.      b. 0.4 Hz.      c. 3 cm.      **d. 5 cm.**

4. The distance covered in a complete oscillation = .....

- a. 0.2 sec.      b. 0.4 Hz.      **c. 20 cm.**      d. 5 cm.

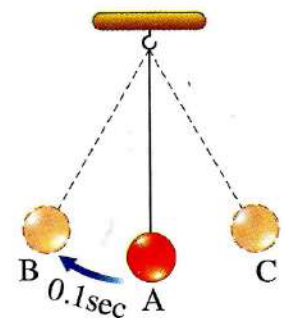


In the opposite figure, when the ball of pendulum moves from (B) to (C) a displacement of (2cm) from the figure,

Find :

1. The amplitude.
2. Periodic time.
3. The frequency.

1- 1 cm      2- 0.4 sec      3-2.5 Hz



Study the following figures, then answer the following questions :

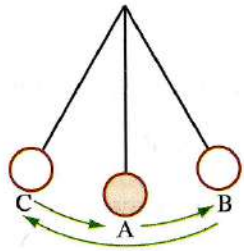


Fig. (1)

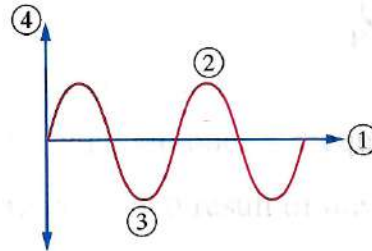


Fig. (2)

1. What are these figures represent ?

2. Label the figure (2).

① ..... ② ..... ③ ..... ④ .....

3. What is the number of displacements in fig. (1) ?

1-Fig 1-Oscillatory motion

Fig 2-transverse wave motion

2-

1-Direction of wave propagation

2-Crest

3-Trough

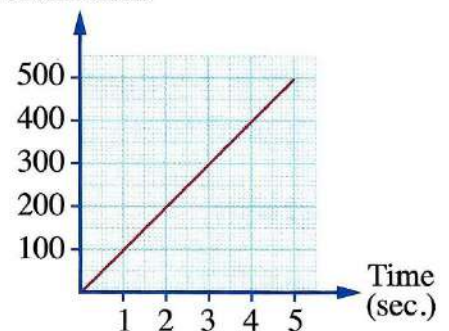
4-Direction of medium particle vibration

3- Four displacements

The opposite graph shows the relation between the number of complete oscillations (N) made by an oscillating body and the time (T) in seconds. From the graph find :

1. The number of complete oscillations made by the oscillating body after 4 seconds.
2. The time in which the oscillating body makes 200 oscillations.
3. The frequency of the oscillating body.
4. The periodic time.

No. of complete oscillations



1-400 complete oscillations

2-2 sec

3-100 oscillation/sec

4-0.01 sec

حمل الآن

مجاناً وحصرياً

# المراجعة رقم (3)

## اختبار شهر فبراير





## Revision on lesson one

### Complete the following:

1. The maximum displacement achieved by the oscillating body away from its rest position is .....
  2. Kinetic energy =  $\frac{1}{2} * \dots\dots\dots$
  3. The amplitude of the simple pendulum is .....
  4. The maximum displacement achieved by the oscillating body away from rest position is .....
  5. The result of multiplying the frequency as an oscillating body by its periodic time equals .....
- 

### Write the scientific term of each of the following:

1. The periodic motion made by a body around its point of rest, where the motion its repeated through equal intervals of time. ( )
  2. The number of complete oscillations produced by the oscillating body in one second. ( )
- 

### Give reason for:

1. The oscillatory motion is considered as a periodic motion.

.....  
.....

2. The motion of rotary bee is a periodic motion only, but it is not an oscillatory motion.

.....  
.....

---

### Problems:

1. From the following figure , choose the correct answer:

a) The periodic time = .....

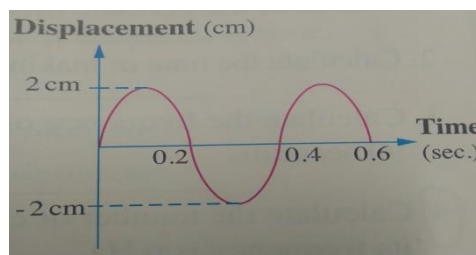
(0.2 sec. , 0.4sec , 0.6 sec , 0.4)

b) Frequency = .....

(0.2 sec. , 0.4HZ , 2.5cycle \ sec , 0.4m)

c) The amplitude = .....

(0.2 sec. , 0.4sec , 2cm , 0.4cm)



2. Calculate the number of complete oscillations that are made by a body in 2 minutes if its frequency is 6 HZ.
3. If the oscillating body makes 480 complete oscillations in one minute, calculate:
  - a. Frequency
  - b. periodic time

## Revision on lesson two

### Complete the following statements:

1. waves are classified according to the ability to propagate and transfer energy into ..... and .....
  2. radio waves are considered as ..... waves that propagate through free space with a velocity of.....
  3. The crest in the..... Wave is equivalent to the..... in the longitudinal wave.
  4. Jacuzzi is used to treat..... and cramps by using hot water and..... By using cold water.
  5. The longitudinal wave consists of ..... and.....
- 

### Write the scientific term:

1. A disturbance that propagate and transfers energy along the direction of propagation. ( )
  2. The highest point of the particles of the medium in the transverse wave. ( )
  3. The area in longitudinal wave at which the medium particles are of the highest density and pressure. ( )
  4. The relationship between wave velocity, frequency and the wavelength in the wave motion. ( )
- 

### Give reason for:

1. The waves produced due to vibration of a string are transverse mechanical waves.

.....

2. We see lightning before hearing thunder.

.....

---

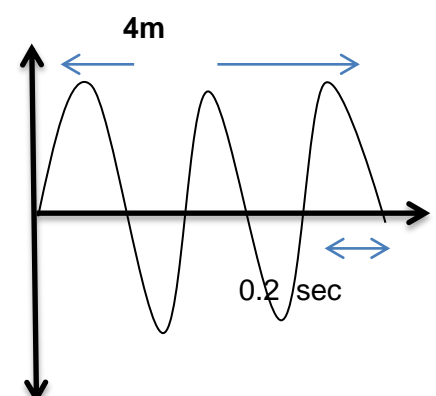
### Problems:

Sound waves of frequency 200Hertz and wavelength in air 1.7metre. Calculate:

- a. the velocity of sound waves propagation in air.
  - b. the wavelength of these waves when they propagate in water with velocity 1500m/s.
- 

from the opposite figure, find:

- 1) wave length
- 2) Frequency
- 3) Amplitude
- 4) wave velocity.



## Revision on unit one

### 1) choose the correct answer:

1. if the periodic time of a tuning fork is 4sec., so the frequency is.....  
a. 4Hz                      b. 6Hz                      c.  $\frac{1}{4}$ Hz                      d.  $\frac{1}{6}$ Hz
2. the sound waves are ..... Waves.  
a. mechanical longitudinal                      b. mechanical transverse  
c. electromagnetic longitudinal                      d. electromagnetic transverse.
3. The wave transfers..... in the direction of propagation.  
a. molecules                      b. energy                      c. matter                      d. force
4. The double of the horizontal distance between a crest and a trough of a transverse wave is known as the .....  
a. frequency                      b. wavelength                      c. amplitude                      d. wave velocity

### 2) write the scientific term:

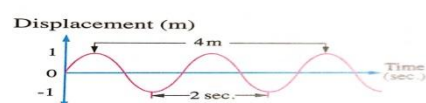
1. The measuring unit of wave velocity. (                      )
2. Physiotherapy tubs which are used to treat sprains , cramps and nervous tention. (                      )
3. Maximum displacement made by the oscillating body away from in rest position. (                      )
4. It is the motion produced as a result of the vibration of the particles of the medium in a certain moment and in a definite direction. (                      )

### 3) Complete the following:

1. Light is ..... waves but sound Is ..... waves.
2. The crest in the ..... wave is equivalent to the ..... in the longitudinal wave.
3. The complete oscillation includes ..... displacements, each is called.....
4. Waves are classified according to the ability to propagate and transfer energy into..... and ..... waves.

### 4) From the opposite figure, find:

- 1) Amplitude.
- 2) Periodic time.
- 3) Frequency.
- 4) Wavelength.



حمل الآن

مجاناً وحصرياً

# المراجعة رقم (4)

## اختبار شهر فبراير







# February Revision

**Mr. Ahmed Elbasha**

★ **(1) Write the scientific term:**

- 1 The distance covered by the wave in one second. (.....)
- 2 Maximum displacement of the oscillating body away from its rest position. (.....)
- 3 It is a disturbance in which the particles of the medium vibrate along the direction of wave propagation. (.....)
- 4 The motion produced as a result of the vibration of the particles of the medium at a certain moment in a definite direction. (.....)
- 5 The number of complete oscillations produced by the oscillating body in one second. (.....)
- 6 The time taken by the oscillating body to make one complete oscillation. (.....)
- 7 The highest point in the transverse wave. (.....)
- 8 Waves that need medium to travel and can't travel in space (.....)
- 9 The point of the lowest density and pressure in the longitudinal wave (.....)
- 10 The time needed by the oscillatory body to make a complete oscillation. (.....)
- 11 The maximum displacement achieved by an oscillating body away from its point of rest. (.....)
- 12 The area in the longitudinal wave, at which the medium particles are of the highest density and pressure (.....)
- 13 Wave consists of crests and troughs. (.....)
- 14 The waves which need a medium to propagate. (.....)
- 15 The motion produced because of the vibration of the particles of the medium at a certain moment and in a certain direction (.....)
- 16 The distance between two successive compressions or rarefactions in a longitudinal wave. (.....)

**\*(2) Choose the right answer:**

1. The amplitude of the simple pendulum is ..... of a complete vibration.  
a. four times.                      b. a quarter.                      c. a half.                      d. double.
2. Light waves are ..... waves.  
a. mechanical transverse                      b. electromagnetic longitudinal  
c. electromagnetic transverse                      d. mechanical longitudinal
3. Speed of ball of simple pendulum ..... as we move away from the rest position.  
a. doesn't affect                      b. decreases                      c. is doubled                      d. no correct answer
4. If the distance between the center of the third compression and that of the fifth compression is 20 cm, the wavelength of this wave is .....  
a. 40 cm.                      b. 20 cm.                      c. 10 cm.                      d. 5 cm.
5. The distance between two successive compressions is called .....  
a. frequency.                      b. periodic time.                      c. wavelength.                      d. velocity.
6. The periodic time of a tuning fork which makes 240 waves in one minute equals ....  
a. 1 sec.                      b. 4 sec.                      c. 0.5 sec.                      d. 0.25 sec.
7. .... waves are longitudinal waves.  
a. Water                      b. Light                      c. Sound                      d. Radio
8. The measuring unit of wave velocity is .....  
a. metre.                      b. metre/sec.                      c. Hz.                      d. sec.
9. All the following are electromagnetic waves except ..... waves.  
a. light                      b. sound                      c. infrared                      d. radio
10. The maximum displacement made by the oscillating body away from its original position is .....  
a. amplitude.                      b. frequency.                      c. periodic time.                      d. complete.
11. Velocity of sound in air equals ..... m/s.  
a. 340                      b. 1500                      c.  $3 \times 10^8$
12. The result of multiplying frequency of an oscillating body by its periodic time equals .....  
a. one.                      b. negative value.                      c. constant value.                      d. variable value.
13. Each complete oscillation consists of ..... amplitudes.  
a. 3                      b. 4                      c. 2                      d. 5

### ✱(3) Complete the following :

1. The crest in the ..... wave is equivalent to the ..... in the longitudinal wave.
2. Transverse wave consists of ..... and .....
3. Waves are classified according to the ability to propagate and transfer energy to ..... and ..... waves.
4. Complete oscillation consists of ..... displacements (amplitudes).
5. Sound wave velocity = ..... x .....
6. Sound travels through air as pulses of ..... and .....
7. .... are transverse waves, while ..... waves may be longitudinal or transverse waves.
8. There are two types of periodic motion which are ..... motion and ..... motion.
9. Sound waves are longitudinal waves because particles of the medium vibrate ..... the direction of wave propagation.

### ✱(4) Correct the underlined words:

1	The crest in the transverse wave is equivalent to the <u>bottom</u> in the longitudinal wave	( ..... )
2	The movement of the clock pendulum is an example of <u>wave motion</u> .	( ..... )
3	<u>Oscillatory</u> motion is the motion that is repeated regularly in equal periods of time.	( ..... )
4	Speed of sound in water is slower than in <u>air</u> .	( ..... )
5	The result of multiplying the frequency of an oscillating body by its periodic time equals <u>variable value</u> .	( ..... )
6	Particles of the medium vibrate along the direction of the wave propagation in the <u>transvers waves</u> .	( ..... )

**\*(5) Give reason for:**

1. The periodic time decreases as the number of complete oscillations increases.  
.....  
.....
2. The waves produced due to vibration of strings are transverse mechanical waves.  
.....  
.....
3. Sound waves are mechanical waves while radio waves are electromagnetic waves.  
.....  
.....
4. Light can travel through free space.  
.....  
.....
5. We see lightning before hearing thunder.  
.....  
.....
6. Oscillatory motion is considered as a periodic motion.  
.....  
.....
7. Sound can be heard from all surrounding directions.  
.....  
.....
8. Water waves are mechanical transverse waves.  
.....  
.....
9. A light wave are considered electromagnetic waves.  
.....  
.....

**\*(6) What happen if:**

1. The frequency of an oscillating body increases (concerning its periodic time) .  
.....
2. The oscillating body passes its rest position during its movement  
(Concerning its velocity).  
.....
3. The frequency of a wave is doubled (concerning the wavelength) when the wave  
velocity is constant.  
.....
4. Vibration of particles of a medium perpendicularly to the direction of wave  
propagation.  
.....
5. The sound wave travels from solid to water (concerning its velocity)  
.....



### ★(7) Put ( $\checkmark$ ) or ( X ) :

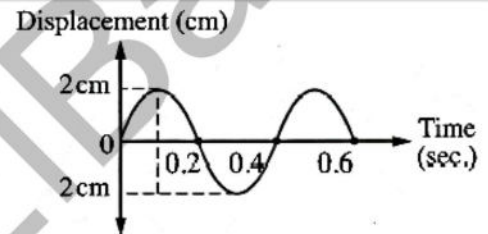
1. The movement of pendulum is an example for wave motion. (     )
2. Sound can be heard from all directions that surround the sound source. (     )
3. Sound velocity through liquids is more than that through gases. (     )
4. The particles of the medium vibrate along the direction of the wave propagation in longitudinal wave (     )
5. Light waves are electromagnetic transverse wave. (     )
6. The sound velocity through solids is less than that through liquids. (     )
7. The transverse wave consists of compressions and troughs. (     )

### ★(8) Problems

1

From the opposite figure, calculate :

1. Amplitude.
2. Periodic time.
3. Frequency.



.....

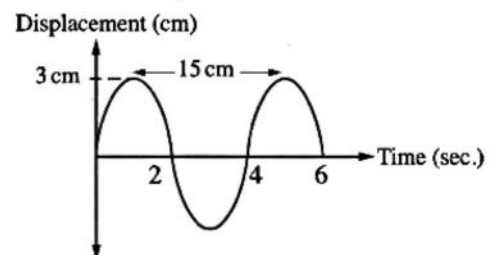
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2

From the opposite figure, calculate :

1. Wavelength.
2. Frequency.
3. Amplitude.
4. Periodic time.



.....

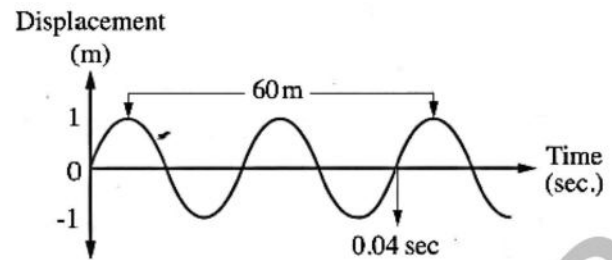
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3

From the opposite figure, calculate :

1. Frequency.
2. Wavelength.
3. Velocity of the wave.



.....

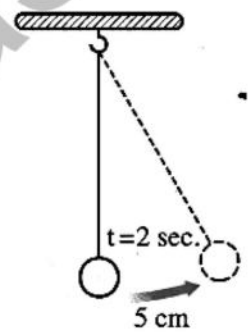
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4

From the opposite figure, calculate the following :

1. Amplitude.
2. Periodic time.
3. Frequency.



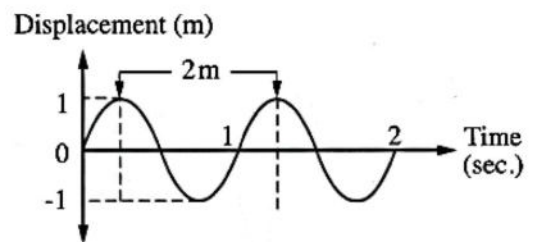
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5

From the opposite figure, find :

1. Wavelength.
2. Frequency.
3. Amplitude.
4. Wave velocity.



.....

.....

.....

## Model Answer

### ✱ (1) Write the scientific term :

- |                      |                     |                      |                                      |
|----------------------|---------------------|----------------------|--------------------------------------|
| 1. Wave velocity     | 6. Periodic time    | 11. Amplitude        | 16. Wavelength of longitudinal waves |
| 2. Amplitude         | 7. Crest            | 12. Compression      |                                      |
| 3. Longitudinal wave | 8. Mechanical waves | 13. Transvers waves  |                                      |
| 4. Wave motion       | 9. Rarefaction      | 14. Mechanical waves |                                      |
| 5. Frequency         | 10. Periodic time   | 15. Periodic motion  |                                      |

### ✱ (2) Choose the right answer:

- |      |      |      |      |      |
|------|------|------|------|------|
| 1. B | 4. C | 7. C | 10.A | 13.B |
| 2. C | 5. C | 8. B | 11.A |      |
| 3. B | 6. D | 9. B | 12.A |      |

### ✱ (3) Complete the following:

- |                                 |                              |                                 |
|---------------------------------|------------------------------|---------------------------------|
| 1. Transverse – compression     | 4. Four                      | 7. Electromagnetic – mechanical |
| 2. Crest - trough               | 5. Frequency x wavelength    | 8. Oscillatory – wave           |
| 3. Electromagnetic – mechanical | 6. Compression – rarefaction | 9. Along                        |

### ✱ (4) Correct the underlined words:

- |                |             |                       |
|----------------|-------------|-----------------------|
| 1. Compression | 3. Periodic | 6. Longitudinal waves |
| 2. Oscillatory | 4. Solid    |                       |
|                | 5. One      |                       |

### ✱ (5) Give reason for:

1. Because the number of complete oscillations is inversely proportional to the periodic time.
2. They are transverse because the medium particles vibrate perpendicular to the direction of wave propagation forming crests and troughs and mechanical because they need a medium to propagate through.
3. Because sound waves need a medium to propagate through, while radio waves don't need a medium to propagate through.
4. Because it is electromagnetic waves which don't need a medium to travel through.
5. Because the velocity of light waves of lightning (electromagnetic waves) is much greater than that of sound waves of thunder (mechanical waves).
6. Because it is repeated regularly in equal periods of time.
7. Because sound travels through air as spheres of compressions and rarefactions whose center is the sound source
8. They are transverse because the medium particles vibrate perpendicular to the direction of wave propagation forming crests and troughs and mechanical because they need a medium to propagate through.
9. Because Light waves don't need a medium to propagate through.

**✱(6) What happen if:**

1. The periodic time will decrease
2. Its velocity increases to the maximum value.
3. The wavelength decreases to its half value.
4. Transverse waves are formed
5. Sound velocity will decrease, since velocity of sound through solids is higher than the velocity of sound through liquids

**\* (7) Put ( √ ) or ( X ) :**

- |                     |                     |        |
|---------------------|---------------------|--------|
| 1. (X)              | 4. ( $\checkmark$ ) | 7. (X) |
| 2. ( $\checkmark$ ) | 5. ( $\checkmark$ ) |        |
| 3. ( $\checkmark$ ) | 6. (X)              |        |

## ☀ (8) Problems

<p><b>1</b></p> <p>1. Amplitude = 2 cm = 0.02 m.</p> <p>2. Periodic time = 0.4 sec.</p> <p>3. Frequency = <math>\frac{1}{\text{Periodic time}} = \frac{1}{0.4} = 2.5 \text{ Hz.}</math></p>	<p><b>5</b></p> <p>1. Amplitude = 5 cm = 0.05 m.</p> <p>2. Periodic time = <math>4 \times 2 = 8 \text{ sec.}</math></p> <p>3. Frequency = <math>\frac{1}{\text{Periodic time}} = \frac{1}{8} = 0.125 \text{ Hz.}</math></p>
<p><b>2</b></p> <p>1. Wavelength = 15 cm = 0.15 m.</p> <p>2. Frequency = <math>\frac{1}{4} = 0.25 \text{ Hz.}</math></p> <p>3. Amplitude = 3 cm = 0.03 m.</p> <p>4. Periodic time = <math>\frac{1}{0.25} = 4 \text{ sec.}</math></p>	<p><b>6</b></p> <p>1. Wavelength = 2 m.</p> <p>2. Frequency = <math>\frac{\text{Number of complete oscillations}}{\text{Time in seconds}} = \frac{2}{2} = 1 \text{ Hz.}</math></p>
<p><b>3</b></p> <p>1. Frequency = <math>\frac{2}{0.04} = 50 \text{ Hz.}</math></p> <p>2. Wavelength = <math>\frac{60}{2} = 30 \text{ m.}</math></p> <p>3. Wave velocity = Frequency <math>\times</math> Wavelength  <math>= 50 \times 30 = 1500 \text{ m/sec.}</math></p>	<p>3. Amplitude = 1 m.</p> <p>4. Wave velocity = Wavelength <math>\times</math> Frequency  <math>= 2 \times 1 = 2 \text{ m/sec.}</math></p>



حمل الآن

مجاناً وحصرياً

# المراجعة رقم (5)

## اختبار شهر فبراير



# 2<sup>nd</sup> Prep. Feb. revision



## (1) Write the scientific term:

- 1- It is a motion which is regularly repeated in equal periods of time. ( )
- 2- It is the motion of oscillating body around its rest point, where the motion is repeated through equal intervals of time. ( )
- 3- It is the maximum displacement done by the oscillating body away from its original position. ( )
- 4- It is the motion of an oscillating body when it passes by a fixed point on its path two successive times in the same direction. ( )
- 5- It is the time taken by an oscillating body to make one complete oscillation. ( )
- 6- It is number of complete oscillations made by an oscillating body in one second. ( )
- 7- It is the disturbance that propagates and transfers energy in the direction of propagation. ( )
- 8- It is the motion produced as a result of the vibration of the medium particles at a certain moment and in a definite direction. ( )
- 9- It is the direction through which the wave propagates. ( )
- 10- It is a disturbance in which the particles of the medium vibrate perpendicular to the direction of wave propagation. ( )
- 11- It is the highest point of the particles of the medium in the transverse wave. ( )

12- It is the lowest point of particles of the medium in the transverse wave.

( )

13-It is the area at which the particles of the medium are of highest density and pressure

( )

14-It is the area at which the medium particles are of lowest density and pressure.

( )

15- It is the distance between two successive crests or troughs. ( )

16-It is the distance between the centers of two successive compressions or rarefactions.

( )

17-It is the maximum displacement achieved by the medium particles away from their rest positions.

( )

18- It is the distance covered by the wave in one second. ( )

19- It is the number of waves produced from the source in one second.

( )

20- Simplest form of oscillatory motion.

( )

## **(2) Give reason for:**

1- The oscillatory motion is considered as a periodic motion.

.....

2- Water waves are transverse waves.

.....

3- Sound waves are longitudinal waves.

.....

4- Sound waves are mechanical waves, while radio waves are electromagnetic waves.

.....

5- Hearing thunder after seeing lightning though they happen at the same time.

6- We can't hear the sound of solar explosions occurring on the sun, but we can see the light coming out of it.

### **(3) Compare between each of the following:**

1) Mechanical waves and electromagnetic waves

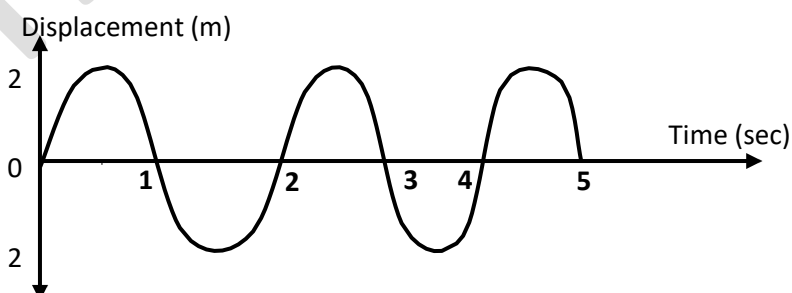
2) Transverse and longitudinal waves.

3) Oscillatory and wave motion.

### **(4) Problems:**

1- From the opposite figure of the oscillatory motion of a simple pendulum, calculate:

- a) Amplitude.
- b) Periodic time.
- c) Frequency.





2- Calculate the periodic time and frequency for an oscillating body that makes 500 complete oscillations in two minutes.

.....

.....

.....

.....

.....

3- Calculate the wave length in meter for a visible light wave of frequency  $5 \times 10^8$  hertz and velocity of  $3 \times 10^8$  m/s

.....

.....

.....

.....

.....

4- A longitudinal wave is produced by a spiral spin such that the distance between the first and fourth compression is 24 m find the wave velocity if the frequency of such wave is 20 Hertz.

.....

.....

.....

.....

.....

5) Calculate the wave length of a sound wave propagating through sea water with velocity 1500 m/sec knowing that its frequency is 100 hertz.

.....

.....

.....

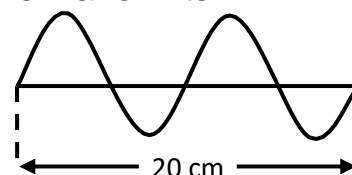
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6) From the opposite figure, calculate the velocity of the wave if its frequency is 25 Hertz.

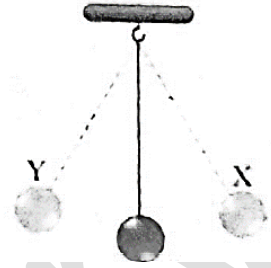
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- 7) From the opposite figure, when the ball of pendulum move from (X) to (Y) In 0.02 sec . find the frequency .

.....  
 .....



### **(5) What is meant by each of the following?**

- 1- The time taken by spring to make 60 complete oscillations is 1 minute.  
 .....
- 2- The frequency of simple pendulum is 50 Hz.  
 .....
- 3- Wave length of sound wave is 30 cm.  
 .....
- 4- Amplitude of vibrating source is 5 cm.  
 .....

## Unit 1 Exam

هذا الاختبار يجيب عنه الطالب بنفسه  
ثم تابع حصة البث المباشر التي  
سيعطى عنها للحصول على الإجابة

### 1-A -Choose the correct answer:

1-If the periodic time of an oscillating body is 0.1 sec., so the number of complete oscillations in one minute is .....

- a. 10                      b. 600                      c. 120                      d. 60

2-All of the following are examples of oscillatory motion, except

- a. motion of a string.                      c. motion of a tuning fork.  
b. motion of a car.                      d. motion of a simple pendulum.

3-The sound waves are .....waves.

- a. mechanical longitudinal                      c. electromagnetic longitudinal  
b. mechanical transverse                      d. electromagnetic transverse

4- If the distance between the center of the third compression and the center of the fifth compression on the wave propagation is 20 cm, then the wavelength of this wave.....

- a. 40 cm.                      b. 20 cm.                      c. 10 cm.                      d. 5 cm.

### B- Give reasons for :

1-Oscillatory motion is considered as a periodic motion.

2-The frequency of the vibrating body decreases by increasing the periodic time.

### 2- A - What is the importance of ...?

Physiotherapy tubs (jacuzzi).....

### B-Put (✓) or ( X ) and correct the wrong ones:

1-The transverse wave is a disturbance that causes the movement of medium particles from their positions ( )

2- The velocity of the oscillating body reaches its maximum value when it passes its rest position ( )

3-The motion of pendulum which includes 3 complete oscillations, includes 12 amplitudes. ( )

4-Wave velocity is constant in the different media. ( )

### 3- A - Write the scientific term of each of the following:

1- Maximum displacement made by the oscillating body away from its rest position. ( )

2- The point of the lowest density and pressure in the longitudinal wave. ( )

- 3- The periodic motion made by a body around its point of rest, where the motion is repeated through equal intervals of time ( )
- 4- The inverse of the frequency. ( )

**B - What are the results of ..?**

1-The increase in the frequency of a wave to double its value with respect to the wavelength when the wave velocity is constant

.....

2-The distance between two successive crests of a transverse wave is doubled.

.....

**C- What's meant by ...?**

1- The frequency of a tuning fork is 652 Hz.

.....

.....

2- The oscillating body makes 540 oscillations in one and a half minute.

.....

.....

هذا الاختبار يجب عنه الطالب بنفسه ثم تابع  
حصة البث المباشر التي سيعلم عنها للحصول



# Answers

## **(1) Write the scientific term:**

- |                                                  |                         |
|--------------------------------------------------|-------------------------|
| 1- Periodic motion                               | 2- Oscillatory motion   |
| 3- Amplitude                                     | 4- Complete oscillation |
| 5- Periodic time                                 | 6- Frequency            |
| 7- Wave                                          | 8- Wave motion          |
| 9- Line of wave propagation                      | 10- Transverse wave     |
| 11- Crest                                        | 12- Trough              |
| 13- Longitudinal wave                            | 14- Compression         |
| 15- Rarefaction                                  |                         |
| 16- Wave length ( $\lambda$ ) of transverse wave |                         |
| 17- Wavelength of longitudinal wave              |                         |
| 18- Amplitude of wave                            |                         |
| 19- Wave velocity                                |                         |
| 20- Wave frequency                               |                         |
| 21- Simple harmonic motion                       |                         |

## **(2) Give reason for:**

- 1- Because the motion of oscillating body is repeated through equal intervals of time.
- 2- Because the water particles vibrate in a direction perpendicular to the direction of wave propagation.
- 3- Because the medium (air) particles vibrate along the direction of waves propagation.
- 4- Because sound wave need a medium to propagate and they don't propagate through vacuum while radio waves don't need medium to propagate.
- 5- Because the light of lightning is from electromagnetic waves, while the sound of thunder is mechanical waves, where the speed of electromagnetic waves is much greater than the speed of mechanical

6- Because the sound is mechanical waves which need a medium to propagate through while the light is electromagnetic waves which can propagate through vacuum.

### **(3) Compare between:**

1) Mechanical waves and electromagnetic waves.

<b>Mechanical</b>	<b>Electromagnetic</b>
1- They need medium to propagate.	2- They do not need medium to propagate.
2- They don't propagate through vacuum (free space)	2- They propagate through vacuum (free space)
3- They are transverse waves or longitudinal waves.	3- They are all transverse waves.
4- Their speed is relatively low. Examples: sound waves (longitudinal) – water waves (transverse)	4- Their speed is great the speed of light = $3 \times 10^8$ m/sec Examples: light waves – radio waves (used in radars)

<b>Point of comparison</b>	<b>transverse</b>	<b>Longitudinal</b>
1- Definition	It is a disturbance in which the particles of medium vibrate perpendicular to the direction of wave propagation.	It is a disturbance in which the particles of medium vibrate along the direction of wave propagation.
2- Composition	crests and troughs	compressions and rarefactions
3- Examples	water waves	Sound waves

3) Oscillatory and wave motion

Points of comparison	Oscillatory	Wave
1- Definition	- it is the motion that is produced by oscillating body at the two sides of its original position.	- It is the motion produced as a result of the vibration of the medium particles at a certain moment and in a definite direction.
2- Velocity	- is maximum when the oscillating body passes its rest position. - is minimum when it goes far from its rest position.	- the wave has a definite velocity along the direction of propagation.
3- Examples	- Pendulum motion - motion of spiral spring	- sound waves as mechanical longitudinal wave. - light waves as electro-magnetic transverse waves.

#### 4- Problems

a) Amplitude (x) = 2 m

b) periodic time (t) = 2 seconds → time of oscillation  
= time / no. complete oscillation  
= 5/2.5 = 2 seconds

c) frequency (f) = 1/periodic time = 1/2 Hz

2- time = 2 × 60 = 120 seconds

Periodic time = time / no. complete oscillation = 120 / 500 = 0.24 sec

Frequency (f) = 1/periodic time = 4.1 Hz

3- Wave length = velocity / frequency =  $\frac{3 \times 10^8}{5 \times 10^8}$

= 0.6 m

4- 3 waves are formed between the first and fourth rarefactions

$$\therefore 4 - 1 = 3$$

$$\therefore \text{Wave length } (\lambda) = \frac{24}{3} = 8 \text{ m}$$

$$\begin{aligned}\therefore \text{Wave velocity } (v) &= \text{wave length } (\lambda) \times \text{wave frequency} \\ &= 8 \times 20 = 160 \text{ m/sec}\end{aligned}$$

$$\begin{aligned}4- \text{Wave length} &= \text{velocity} / \text{frequency} \\ &= 1500 / 100 = 15 \text{ m}\end{aligned}$$

$$\begin{aligned}5- \text{Wave velocity } (v) &= \text{wave length } (\lambda) \times \text{wave frequency} \\ &= 0.1 \times 25 = 2.5 \text{ m/s}\end{aligned}$$

$$\begin{aligned}6- T &= 0.02 \times 2 = 0.04 \text{ Sec} \\ F &= 1/T = 1 / 0.04 = 25 \text{ Hz}\end{aligned}$$

### **(5) What's meant by:**

- 1- The periodic time of spring is  $= 60/60 = 1 \text{ sec}$ .
- 2- Number of complete oscillation made by pendulum in one sec is 50 complete oscillations.
- 3- Distance between centers two successive compressions or centers of 2 successive rarefactions is 30 cm.
- 4- Maximum displacement achieved by medium particles away from their rest positions is 5 cm.



# كيفية طباعة صفحات معينة من ملف معين

## مثلا ازاي نطبع الصفحات من صفحة 4 الى صفحة 9

